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POLISH INFECTION CONTROL NURSES – SELF-ASSESSMENT OF THEIR DUTIES AND PROFESSIONAL AUTONOMY IN DIFFERENT TYPES OF HOSPITALS

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ABSTRACT

Background: The objective of the study is self-assessment of Polish infection control nurses (ICNs) in terms of the structure of professional tasks and autonomy of decision-making. **Material and Methods:** A questionnaire survey was filled out by 208 ICNs (around 21% of all Polish ICNs) in 15 provinces located in Poland. The research encompassed ICNs surveillance healthcare-associated infections (HAIs) in 2014. **Results:** The work time that ICNs devote to professional tasks and decision autonomy on the scale of 1–100% was as follows: 34% (67% of decision autonomy) was dedicated to detecting and registering HAIs, 12% (71%) to internal control, 10% (58%) to devising and implementing infection prevention practices, 10% (68%) – staff trainings, 8% (65%) – identification and study of outbreaks, 7% (58%) – promoting hand hygiene, 6% (51%) – consults with infected patients, 4% (57%) – consults on decontamination, 4% (54%) – consults on maintaining cleanliness, 3% (51%) – isolation and application of personal protective measures, 2% – other tasks. Infection prevention and control nurses estimated, on average, that their autonomy of decisions concerning the professional tasks performed amounted to 60%. **Conclusions:** Infection control nurses in Poland have difficulty in achieving balance between tasks they perform and the authority they exercise. The ICN professional task structure is dominated by duties associated with monitoring hospital infections, however, the greatest decision autonomy is visible regarding internal control. Decision-making concentrated on internal control may hinder building a positive image of an ICN. We should strive to firmly establish professional tasks and rights of ICNs in legislation concerning performing the duties of a nurse and midwife. *Med Pr* 2018;69(6)

Key words: workplace, healthcare-associated infections, work organization, work load, infection prevention and control nurse, decision autonomy

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INTRODUCTION

The model of modern healthcare-associated infection (HAI) control dates back to the seventies of the last century, when a new group of infection control professionals – infection control nurses (ICNs) – appeared in Europe and the USA, who worked as a part of a multi-disciplinary hospital infection control (IC) team. The primary professional activity for ICNs is preventing and controlling the transmission of HAI or infectious agents, collecting and analyzing data on the incidence of HAIs, recognizing and isolating outbreaks of infectious diseases and others. Post-graduate programs

for ICN will cover core subjects such as infectious diseases and infection control in healthcare settings, as well as microbiology, bio-statistics, epidemiology, public health [1,2]. In some countries, ICNs constitute a sub-specialization of clinical nurse specialists; in Poland, there is independent nursing specialization (here, it is formally called epidemiological nursing). The IC team must propose priorities and necessary resources, objectives, development methods, implementation and follow-up. The strategic approach must be discussed and approved by the IC committee, comprising the hospital administrators, medical and nursing directors, a microbiologist, a hospital pharmacist and

a delegation of clinicians. Follow-up of the projects is regularly presented to the committee by the IC team. The IC committee is also responsible for the design and follow-up of the IC program, which should include objectives and indicators to be measured and evaluated periodically [3,4].

In Poland, the modern HAI control has a tradition of about 20 years, nowadays each hospital has an obligation to employ a professional IC team comprising ICNs, a physician, and in certain situations, microbiologist diagnosticians, and based on the results of the European Centre for Disease Prevention and Control (ECDC) Point Prevalence Survey, there is a strong probability that Polish hospitals meet formal requirements [5]. However, a more detailed analysis of publications dedicated to the problem of HAIs in Poland indicated that the actual shape of IC was not optimal, the problem mainly concerned the patients of intensive care units (newborns and adults) [6–8]. In addition, multi-centre studies, which aimed at analyzing the spread of multi-drug resistant micro-organisms (MDRO) in Polish hospitals, revealed that the procedures of infection prevention were not sufficiently effectively or properly used in practice [9,10]. It is difficult to clearly assess whether it is caused by the insufficient knowledge, negligence of infection prevention procedures, or inadequate hospital resources.

Among various procedures used for preventing HAI, unlike the situation in other countries, Polish studies focused on diverse aspects of hand hygiene, including the application of the theory in practice and numerous studies have shown an unsatisfactory level of knowledge in this respect among different groups of medical personnel, as well as low rates of compliance with hand hygiene [11–15].

The aim of this study has been to analyze the scope of ICN actions and responsibilities in Poland and their real impact on the implementation of IC tasks.

MATERIAL AND METHODS

The study conducted in 2014 used the method of diagnostic survey based on an anonymous questionnaire with questions of our own design. Sampling was purposeful and focused on a group of ICNs. Nurses working in the HAI surveillance in 2014 ($N = 1011$) accounted for 0.4% of the entire population of nurses entitled to practice in Poland and 1% of nurses employed in Polish hospitals. Until 2015, 1640 Polish nurses completed the specialization for ICN, that is 0.6% of nurses eligible to practice in Poland. During the study, more than a half,

i.e., 1011 (61.6%) of ICNs with specialization worked in the HAI surveillance.

Probability sampling was applied for the ICN sample studied. The research included professionally active ICNs who, at the time of the study, were working in hospital infection control teams. Survey questionnaires were distributed among the ICNs who took part in a national scientific and training conference organized by the Polish Association of Epidemiological Nurses (PAEN). The PAEN management board gave its consent to conduct the study. During the general meeting of PAEN members, 250 survey questionnaires were distributed among ICNs and 208 correctly completed questionnaires were returned. The ICNs under investigation came from a number of regions of Poland.

The questionnaire survey asked ICNs to give an answer to the question concerning the percentage share of individual tasks (responsibilities) in their daily work taking into account the scale 1–100%. Subsequently, they were asked about the scope of their autonomy in performing the tasks on the scale 1–100%. On this basis, the influence of ICNs on decisions made in various areas of infection control was estimated. The results obtained were analyzed considering various dependent and independent variables.

The study adopted as independent variables all the factors that might have an impact on the work of ICNs, such as age, education, work experience, the place of work, the status of the hospital, completed specializations. Dependent variables included: duties carried out at the place of employment and freedom of decision-making within the infection surveillance system. The statistical analysis used statistical program IBM SPSS Statistics. The description of data for the entire study population was drawn up using mean, standard deviation, confidence intervals, ANOVA significance level, minimum and maximum, independent χ^2 test and indicators of measurement error or uncertainty in order to compare the frequency of variations in the quality characteristic in several populations. The study was approved by the Ethics Committee of the Jagiellonian University, decision No. 122/6120/124/2016.

RESULTS

The study included 208 ICNs, and accounted for 21% of all Polish ICNs. As many as 88% of the study group completed professional specialization. The mean age of ICNs was 48.7 years old ($Me = 48$). The study ICN group had an average of 10 years of professional experience.

rience in the HAI control (Me = 10, SD = 5.5), the longest work experience was 28 years. The surveyed nurses worked in hospitals with the average number of ICNs of 1.7 for 250 beds and this number was linked with the hospital size.

Infection control nurses devoted most of their time to HAI monitoring and registration, which took about 1/3 of their work time (34% precisely). Undeniably, they reserved less time for infection prevention procedures audit (12% of work time), which took second place. Subsequent places were taken by tasks, execution time of which was equal to or lower than 10% of ICNs' work time (Table 1).

As for variables used for analyzing the distribution of ICNs' work time, a significant difference was observed only in the hospital location: ICNs working in the cities of over 100 000 residents declared conducting internal control less often than those working in the smaller cities. In the opinion of the surveyed ICNs, their influence on decisions concerning various areas of IC was 56% and up to 44% of ICNs could not take independent decisions connected with their profession. The greatest decision-making ability was declared by the studied ICNs as regards conducting "infection prevention process audit" – 71% (Me = 100%). Infection control nurses decision-making ranging 60–70% was also indicated for the following tasks: staff training, monitoring and registering infections and identifying and containing epidemic outbreaks. The remaining professional tasks determined decision-making at below 60%, however not less

than 50% (Table 2). The analysis of variables revealed significant differences in the following areas: in private hospitals ICNs declared greater decision-making in the isolation of patients and creation of procedures than in the public ones. As the number of ICNs in the hospital increased, decision-making of the surveyed ICNs decreased, these differences were significant among others in creation of procedures ($p < 0.001$) (Table 3). The size of the hospital had an impact on the independence of decision-making by ICNs: the larger the hospital, the smaller the impact of nurses on decisions taken in various areas of IC (Table 4). Two ICN groups were distinguished among the studied nurses, which were divided according to their opinion (the answer to the open-ended question in the questionnaire survey) concerning the assessment of the changes which have taken place in recent years in the system of HAI monitoring in the category positive changes or negative changes. On the basis of the analysis conducted, it was found that the estimated degree of influence that ICNs had on decisions made in carrying out professional tasks was lower among nurses who described negative changes in the supervision of HAI. The results are presented in the Table 5.

DISCUSSION

Changes that took place in the Polish healthcare in the 1990s created a positive climate of openness around the infection control. The legislation of that time on management and financing of the healthcare system

Table 1. Individual tasks* in total infection control nurse (ICN) (N = 208) work time

Task	Individual task in total ICN work time [%]				
	M	95% CI	SD	min.	max
Monitoring and registration of infections	34	12.71–42.98	10	5	40
Infection prevention process audit	12	7.83–10.48	3.28	0	15
Development and implementation of prevention procedures	10	8.15–9.33	2.92	2	15
Staff training	10	7.80–9.82	2.49	5	15
Identification and development of outbreaks	8	6.68–11.39	5.83	0	30
Hand hygiene	7	3.86–15.30	14	0	72
Consulting patients with HAI	6	4.10–6.36	2.8	0	10
Consulting on decontamination	4	3.23–5.47	2.77	0	10
Consulting on maintenance of cleanliness	4	2.63–4.37	4	0	15
Isolation, use of personal protective equipment	3	2.59–4.33	2.15	1	10
Duties other	2	0.89–3.35	7.4	0	72

* Professional tasks for which Polish ICNs are entitled after completion of specialization.
HAI – healthcare-associated infection.

Table 2. Infection control nurse (ICN) (N = 208) influence on decisions taken in various areas of infection control

Task	Estimated degree of influence on decisions [%]			
	M	95% CI	Me	SD
Infection prevention process audit	71	64.71–77.29	100	39
Staff training	68	61.52–74.13	95	39
Monitoring and registration of infections	67	60.70–72.86	90	38
Identification and development of outbreaks	65	58.96–71.58	88	39
Development and implementation of prevention procedures	58	51.47–64.24	80	40
Hand hygiene	58	51.63–63.91	70	38
Consulting on decontamination	57	50.23–62.98	70	40
Consulting on maintenance of cleanliness	54	47.57–59.96	50	39
Isolation, use of personal protective equipment	51	45.30–57.58	50	38
Consulting patients with HAI	51	44.65–56.91	50	38
Total (M)	60	–	74	–

HAI – healthcare-associated infection.

Table 3. Infection control nurse (ICN) (N = 208) influence on decisions taken in various areas of infection control according to the number of nurses in hospital

Task	Estimated degree of influence on decisions in hospital* [%]			p
	< 2 ICN	2–2.9 ICN	≥3 ICN	
Infection prevention process audit	76	68	63	0.2
Staff training	72	69	53	0.08
Monitoring and registration of infections	71	67	55	0.2
Identification and development of outbreaks	69	62	60	0.5
Development and implementation of prevention procedures	6	59	29	< 0.001
Hand hygiene	58	58	57	0.9
Consulting on decontamination	62	54	50	0.3
Consulting on maintenance of cleanliness	59	51	50	0.4
Isolation, use of personal protective equipment	57	47	47	0.3
Consulting patients with HAI	59	49	38	< 0.05
Total (M)	65	58	50	–

* Full time equivalent.

p – ANOVA significance level.

HAI – healthcare-associated infection.

had brought favorable conditions to build the system of IC in Poland and adopted the model, which is close to the German system: based on teamwork of epidemiologists, nurses and doctors with the concentration on hospital hygiene [16]. The Polish model was based on IC teams and committees with the established position of a physician in the IC team. This scheme is also typical for Italian hospitals as Moro et al. demonstrated the presence of committees in all hospitals participating in

the study and IC team in 80% of them, but also indicated difficulties in ensuring the sufficient number of qualified IC members [17]. Similar results were obtained by Sánchez-Payá et al. in Spain, where there was 1 ICN per 250 beds in 17.4% of hospitals and 1 physician per 500 beds in 26.3% of hospitals [18]. According to the ECDC report, there is a great diversity of employing IC nurses based on full-time equivalents (FTE) in various European countries with the average of 1.31 ICNs

Table 4. Infection control nurse (ICN) (N = 208) influence on decisions taken in various areas of infection control in hospitals of different size

Task	Estimated degree of influence on decisions in hospital [%]				p
	< 200 beds	201–399 beds	400–599 beds	≥ 600 beds	
Infection prevention process audit	75	79	68	58	< 0.05
Staff training	69	75	69	56	0.09
Monitoring and registration of infections	66	77	68	53	< 0.05
Identification and development of outbreaks	64	73	64	55	0.2
Development and implementation of prevention procedures	62	69	62	37	< 0.001
Hand hygiene prevention	58	61	57	53	0.7
Consulting on decontamination	59	66	51	45	< 0.05
Consulting on maintenance of cleanliness	57	62	51	43	0.09
Isolation, use of personal protective equipment	59	59	50	76	< 0.05
Consulting patients with HAI	56	57	49	39	0.1
Total (M)	63	68	59	47	

p – ANOVA significance level.

HAI – healthcare-associated infection.

Table 5. Evaluation of changes occurring in the HAI surveillance and the scope of responsibilities of ICN (N = 208)

Task	Positive changes		Negative changes	
	%	95% CI	%	95% CI
Infection prevention process audit	72	65.20–78.58	58	45.99–69.08
Monitoring and registration of infections	65	58.35–71.82	59	48.48–69.77
Identification and development of outbreaks	65	58.61–72.16	51	39.93–62.61
Hand hygiene prevention	58	60.99–74.52	54	42.42–64.42
Consulting of patients with HAI	58	50.73–64.40	43	32.87–54.04
Development and implementation of prevention procedures	57	50.36–64.20	47	36.33–57.80
Staff training	57	50.56–63.84	41	30.82–50.85
Consulting on maintenance of cleanliness	55	47.89–61.20	41	30.81–51.01
Consulting on decontamination	53	46.11–59.13	39	29.05–48.06
Isolation, use of personal protective equipment	51	44.28–57.52	42	31.53–52.01
Total (M)	59	–	48	–

HAI – healthcare-associated infection, ICN – infection control nurse.

per 250 beds [5] – that is very close to our data, but in the PROHIBIT study the median employment was 4 ICNs per 1000 beds [19]. The index of the ICN number in Polish hospitals seems to be satisfactory, however, the results of age analysis conducted in this professional group are worrying, the study sample of ICNs fully reflects the age structure of Polish nurses, the population of which is currently referred to as “demographically old” [20].

It is not only the organizational structure of the IC and the number of employed ICNs that have an impact

on the HAI prevention, as the scope of responsibilities and division of daily tasks among members of IC teams may be equally important [21–23]. Our research showed that declaratively HAI monitoring was the most important task of ICNs – it constituted approx. 1/3 of the work time with 67% of ICNs who had an influence on decisions taken. It is difficult to evaluate “rough” results of organization and efficiency of infection detection based on epidemiological data, because to the best of our knowledge, Poland has no (regional or national) HAI

surveillance network, which would allow to collect data based on the same identification criteria and use the same tools, and where results would be subject to systematic analyses and comparisons. The ECDC reports, which come from the active, continuous, targeted infection surveillance, lack data from Poland [5]. Polish hospitals in large numbers participate in the Point Prevalence Survey (PPS) program [5], however, this method is not the best solution to describe the actual epidemiological situation, its conditions and effects directly for hospital IC teams. The study conducted as a part of the PROHIBIT project found discrepancies in the model of IC between Polish and European hospitals, where all studied Polish hospitals declared the registration of bloodstream infections (BSI), pneumonia (PNU), urinary tract infections (UTI), *Clostridium difficile* infection (CDI) and MDRO in all departments (in the entire hospital), while in European hospitals PNU was recorded in all departments in only 31% of hospitals, UTI – 36%, BSI – 47%, MDRO – 87%, and CDI – 93% [20]. This may indicate a misunderstanding of the essence of surveillance and the rules of its implementation.

Staff education is an important issue in the IC. The surveyed ICNs devoted 10% of their work time to training of personnel. The fundamental role of IC education was confirmed by many authors [24]. As for the organization of IC in Polish hospitals, it is difficult to assess the effectiveness of educational actions in this regard because there are no studies on this subject in scientific literature. Reports on IC education of medical workers show that more and more time should be devoted and more attention ought to be paid by ICNs to training. Kołpa et al. found that medical workers who participated in training on infection prevention demonstrated a higher level of knowledge in this regard than those who did not take part in such training [25]. As for the frequency and quality of training in hand hygiene, the results of the study conducted by Róžańska et al. are also unsatisfactory [12]. In this study, conducted among students of the Jagiellonian University Medical College, 20% of respondents declared that clinical practices performed by students were not preceded by training in hospital hygiene. In addition, 40% of the respondents who completed training before clinical practice admitted that it was carried out by occupational health and safety inspectors: administrative, not medical, workers with substantial knowledge [12], and this is not surprising, given the small amount of time devoted by ICNs to staff education, as demonstrated in our study.

Validation of effectiveness, which involves audit of compliances, is an important aspect of training. The literature analysis emphasizes the effectiveness and positive impact of audit on the IC [26,27]. In our study, the surveyed ICNs declared that internal infection prevention process audit activities constituted approx. 12% of their work time. Although this study did not include questions about methods, scope and frequency of audit, the results of the research conducted within the PROHIBIT project raise doubts as regards whether internal control in the infection surveillance system brings effective results/is sufficiently effective. In our previous study, most units declared that IC teams monitored the compliance with hand hygiene [20]. At the same time, 67% of the entities did not provide infection prevention procedures compliance indicators for intensive care units and others, and declared that no sanctions were imposed on employees who repeatedly violated the IC rules [20].

The studies conducted by Charrier et al. revealed that the knowledge of IC procedures among medical staff was not sufficient enough to incline them to use the rules in practice [28]. In this aspect, a disparity may arise between the theory and barriers in the daily use of IC procedures. Therefore, the creation of IC programs needs to include the opinions of experts from various fields of science, such as management, psychology, sociology, etc. Hofstede et al. [29] examined the relationship between organizational culture and national culture in many European countries (including Poland). The authors described certain patterns of thinking, feeling and behavior that distinguished one group from another and were typical of a nation. They defined the following dimensions of national culture, which turned out to be universal for all people and included: power distance, individualism, masculinity and uncertainty avoidance [29]. According to these studies, in Poland people have a high degree of power distance (emotional space separating subordinates and superiors), moderate individualism, rather masculine patterns of behavior and a very high degree of uncertainty avoidance. In countries with high power distance, superiors and subordinates originally view each other as not equal in status. This is reflected in the work of infection control teams and infection control committees in Poland (including the ICN work). We face centralization of power and expanding vertical hierarchical structures of supervisory staff. Organizations with this type of superior subordinate relationship are characterized by a big emotional charge [29].

The IC in Poland, with its hierarchical structure and ICN situated at the lowest level, is a classic example of this organizational structure. In the process of professional socialization, nurses are taught to be selfless, humble, patient, work hard and sacrifice their own good, but their own initiative is not welcome [30]. According to the Hofstede's theory, in countries with high power distance, subordinates are expected to execute commands and not to have their own initiatives [30]. Perhaps, this is the reason why ICNs perform activities which should be done by other IC members, such as consulting patients with healthcare-associated infections. Numerous studies have demonstrated the need to improve interpersonal communication and egalitarian division of tasks [21–23]. Another problem is the lack of autonomy in decision-making by ICNs, incomplete autonomy and little independence. Perhaps, this also indicates the lack of authority to make decisions important to the IC system. Professional hierarchy, which is so obvious in Polish hospitals, does not allow to consider an ICN a partner. Experts who study the conditions of medical profession development draw attention to the stereotypes that are deeply rooted in the society as regards health professions: the doctor is associated with power, while a nurse must obediently execute his commands [30]. Perhaps, this is due to the status of nurses, as a semi-professional group, a subsidiary in the work to doctors.

To sum up, the creation of HAI surveillance system in Poland has failed to work out a satisfactory environment for ICNs in terms of their rights, independence, autonomy and decision-making, and balance between duties and professional autonomy.

CONCLUSIONS

1. The group of ICNs in Poland is homogeneous in terms of the level of education, professionalism, tasks and autonomy of decision-making.
2. It is necessary to better establish the profession of ICNs in the legislation in order to attain balance in rights, duties and responsibilities. This ought to improve the quality of team work.
3. We should aim to reduce power distance within IC teams, between IC teams, other professional groups and between medical staff and patients.
4. It is necessary to reduce the uncertainty of action within the IC system, both at the level of hospital and supervising external bodies, by assigning tasks to all members of hospital IC teams, including ICPNs.

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